CDF Central Detector Move Procedure

This procedure outlines the requirements for the movement of the 2300 ton CDF Central Detector. The controlling documents for this procedure are in the form of two checklists: (1) “Moving the CDF Central Detector into the Collision Hall Checklist”, and (2) “Moving the CDF Central Detector into the Assembly Hall Checklist”. The appropriate checklist shall be completed for each detector moving operation. Completed checklists will be kept in a binder located in the CDF Main Control Room.

Editorial Hand-Processed Changes Other Than Spelling
Require Department Head Approval

HPC Number	Date	Section Number	Initials
1.			
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Approvals

(CDF Department Head)	(Date)
(Particle Physics Division Head)	(Date)
(Beams Division Head)	(Date)

1.0 Controlled Copies of this procedure.

At least three controlled copy of this procedure will exist.

One will be held in the CDF Department Office Library.

The others will be on the CDF web page at

http://www-cdf.fnal.gov/cdfsafe/cdfproclist.html

and at

ADMIN.CDF / ES&H / PROCEDURES

All other copies will be marked, " INFORMATIONAL COPY ONLY "

2.0 Procedure

The procedural details of the move operation are contained in the “Moving the CDF Central Detector into the Collision Hall Checklist” in Appendix One and the “Moving the CDF Central Detector into the Assembly Hall Checklist” in Appendix Two of this document.

3.0 Checklist

The “Moving the CDF Central Detector into the Collision Hall Checklist” form (Appendix One of this procedure) or the “Moving the CDF Central Detector into the Assembly Hall Checklist” form (Appendix Two of this procedure) are the controlling documents for each detector move. Completed checklists shall be kept in a binder with the controlled copy of this procedure in the CDF Operations Department.

4.0 Deviations from the Procedure

Any deviations from this procedure must be approved by the CDF Project Engineer, the CDF Assistant Dept. Head(s), or the CDF Operations Manager(s) and so noted in the comments section of the checklist governing that specific operation.

5.0 Required Training and Authorized Training Personnel.

Prerequisite training is needed for this procedure.

- All Personnel must have access training appropriate to the location of the work.
- Hard Hat
- TLD Badge
- Safety Glasses if near the high pressure hydraulic hoses
- Gloves

Authorized training personnel are listed below:

Harry Carter, ID# 3236
Richard Worland, ID#1952
John Voirin, ID#4940
Dervin Allen, ID#6220

6.0 Training Materials.

A copy of this procedure

7.0 List of Trained Personnel for this procedure.

The list of trained personnel for this procedure will exist in written form in the CDF Operations Department copy of this procedure.

Dervin Allen
Harry Carter
Craig Olson (operator)
Wayne Shaddix
Mark Shoun
John Voirin (operator)
Dick Worland

This list may eventually reside in a Lab-wide database as well.

8.0 References and Supporting Documentation.

References: None.

Supporting Documentation: None.

Appendix One: Moving the CDF Central Detector into the Collision Hall Checklist

The minimum number of personnel required to conduct this operation is eight, at least three of which must have participated in prior detector move operations. An experienced equipment operator, whose function is to operate the unified hydraulic jacking system controls and to watch for any problems, is required. The move supervisor will assure that this checklist is followed and that all operations are conducted in a safe, efficient manner. A cable carrier move leader will supervise personnel to assure that the cable carrier is moved in a safe, efficient manner. Remaining personnel are to assist the supervisor as follows: Three mechanical workers will assist the move supervisor in the mechanical move of the detector, and three cable carrier workers will assist the cable carrier move leader in moving that device. The move supervisor is in charge of all personnel and has overall responsibility for the detector move. During the move operation, no other work is to be performed in the immediate area around the central detector and cable carrier.

Date of Move Operation: _____

Printed Name of Equipment Operator: _____

Printed Name of Move Supervisor: _____

Printed Names of Mechanical Workers: _____

_____

Printed Name of Cable Carrier Move Leader _____

Printed Names Of Cable Carrier Workers: _____

_____

Printed Name of Person Completing This Checklist: _____

I. Preparation for Move

Mechanical Work

___ A. Install the push/pull brackets on the south side of the central detector.
___ B. Clean the floor and steel rails. Remove the blue plastic caps from the screw and pin holes in the steel rails. Vacuum any foreign material from all holes. Chase tapped holes with a tap if needed.
___ C. Connect the push/pull cylinders to the push/pull brackets.
___ D. Inspect underneath the central detector for foreign objects and debris.
___ E. Align the eight hilman rollers to facilitate a southerly movement of the detector.

I. Preparation for Move (continued)

___ F. Connect the unified jacking system to the installed push/pull cylinders and to the eight hydraulic jacks of the detector lifting system.
___ G. Assure that all personnel working around the hydraulics are wearing eye protection.
___ H. Pressurize the eight hydraulic jacks to 1000 psig and verify that no oil leaks are present. Leave this pressure on the jacks until final pressurization to lift the detector is conducted.
___ I. Verify that all four of the end plug rail extensions have been removed.
___ J. Verify that all four end plug relay racks are driven to the fully “in” position.
___ K. Verify that no mechanical obstructions that would interfere with the southerly motion of the central detector into the collision hall exist.
___ L. Verify that the solenoid support strain gage monitoring system is operational.
___ M. Verify that all cryogenic and gas system lines have been disconnected.
___ N. Verify that all ECW, SUVA and SVX cooling system lines have been disconnected. Refer to the individual system disconnect procedures in order to safely conduct these operations.

Cable Carrier Work

___ O. Verify that no obstructions prevent cable carrier movement.
___ P. Verify that all cables are secured in their proper locations.
___ Q. Remove inside walkways, gratings, as required to facilitate movement.
___ R. Verify that all supporting cable u-bolts are fully tightened. Do not over-tighten the nuts!

II. Move Operation

The detector will be moved in a southerly direction until it is properly aligned to the beam centerline in the collision hall. Two push/pull cylinders are used to move to the south. One worker is positioned at each push/pull cylinder, the operator is stationed at the unified jacking system, and the move supervisor positions himself so that he can observe the operation of both push/pull cylinders and act as a signalman to the operator. Initially, the detector is pulled toward the collision hall, then the push/pull brackets and cylinders are moved to the north side of the detector in order that the remainder of the move is conducted by pushing it to the south.

The cable carrier move leader will station one person inside the cable carrier to observe that the cables transition through the bend smoothly and to watch for any other problems. A person will also be stationed on the catwalk at each side of the cable carrier in order to remove the carrier segment supporting pins as the detector moves toward the collision hall.

___ A. Move the detector as described above until it is in position on beam centerline in the collision hall.

___ B. Using laboratory surveyors to check detector alignment, perform final adjustments to detector position as needed.
___ C. When B. above is completed, the central detector will be resting on the collision hall set of shim packs, accurately aligned to the Tevatron beam line.

III. Secure from Move Operation

___ A. Disconnect all hydraulic hoses and store them on the unified system hose reel.
___ B. Disconnect the push/pull cylinders and brackets from the central detector and remove them to a secure location and store.
___ C. Remove the eight Hilman rollers and their respective hydraulic cylinders from under the detector and store them in a secure location in the assembly hall.

___ D. Place the completed checklist in the three-ring binder in the CDF Main Control Room.

IV. Comments---Note any comments regarding this specific operation and list all deviations from this procedure below:

End of Checklist

Appendix Two: Moving the CDF Central Detector into the Assembly Hall Checklist

The minimum number of personnel required to conduct this operation is eight, at least three of which must have participated in prior detector move operations. An experienced equipment operator, whose function is to operate the unified hydraulic jacking system controls and to watch for any problems, is required. The move supervisor will assure that this checklist is followed and that all operations are conducted in a safe, efficient manner. A cable carrier move leader will supervise personnel to assure that the cable carrier is moved in a safe, efficient manner. Remaining personnel are to assist the supervisor as follows: Three mechanical workers will assist the move supervisor in the mechanical move of the detector, and three cable carrier workers will assist the cable carrier move leader in moving that device. The move supervisor is in charge of all personnel and has overall responsibility for the detector move. During the move operation, no other work is to be performed in the immediate area around the central detector and cable carrier.

Date of Move Operation: _____

Printed Name of Equipment Operator: _____

Printed Name of Move Supervisor: _____

Printed Names of Mechanical Workers: _____

_____

Printed Name of Cable Carrier Move Leader _____

Printed Names Of Cable Carrier Workers: _____

_____

Printed Name of Person Completing This Checklist: _____

I. Preparation for Move

Mechanical Work

___ A. Inspect underneath the central detector for foreign objects and debris.
___ B. Clean the floor and steel rails. Remove the blue plastic caps from the screw and pin holes in the steel rails. Vacuum any foreign material from all holes. Chase tapped holes with a tap if needed.
___ C. Install the eight hilman rollers and cylinders under the central detector and align them to facilitate a northerly movement of the detector.
___ D. Install the push/pull brackets on the north side of the central detector.
___ E. Connect the push/pull cylinders to the push/pull brackets.

I. Preparation for Move (continued)

___ F. Connect the unified jacking system to the installed push/pull cylinders and to the eight hydraulic jacks of the detector lifting system.
___ G. Assure that all personnel working around the hydraulics are wearing eye protection.
___ H. Pressurize the eight hydraulic jacks to 1000 psig and verify that no oil leaks are present. Leave this pressure on the jacks until final pressurization to lift the detector is conducted.
___ I. Verify that all four of the end plug rail extensions have been removed.
___ J. Verify that all four end plug relay racks are driven to the fully “in” position.
___ K. Verify that no mechanical obstructions that would interfere with the northerly motion of the central detector into the assembly hall exist.
___ L. Verify that the solenoid support strain gage monitoring system is operational.
___ M. Verify that all cryogenic and gas system lines have been disconnected.
___ N. Verify that all ECW, SUVA, and SVX cooling system lines have been disconnected. Refer to individual system procedures to safely conduct these operations.
___ O. Verify that all vacuum system lines, supports, and cables have been disconnected.

Cable Carrier Work

___ P. Verify that no obstructions prevent cable carrier movement.
___ Q. Verify that all cables are secured in their proper locations.

II. Move Operation

The detector will be moved in a northerly direction until it is well into the assembly hall pit area. One worker is positioned at each push/pull cylinder, the operator is stationed at the unified jacking system, and the move supervisor positions himself so that he can observe the operation of both push/pull cylinders and act as a signalman to the operator. Initially, the detector is pulled toward the assembly hall, then the push/pull brackets and cylinders are moved to the south side of the detector in order that the remainder of the move is conducted by pushing it to the north.

The cable carrier move leader will station one person inside the cable carrier to observe that the cables transition through the bend smoothly and to watch for any other problems. A person will also be stationed on the catwalk at each side of the cable carrier in order to insert the carrier segment supporting pins as the detector moves into the assembly hall.

___ A. Move the detector as described above until it is in position in the assembly hall pit area.

___ B. Place the assembly hall shim packs underneath the detector supporting legs.
___ C. Lower the detector onto the shim packs and depressurize the eight hydraulic cylinders.

III. Secure from Move Operation

___ A. Disconnect all hydraulic hoses and store them on the unified system hose reel.
___ B. Disconnect the push/pull cylinders and brackets from the central detector and remove them to a secure location and store.

___ C. Place the completed checklist in the three-ring binder in the CDF Main Control Room.

IV. Comments---Note any comments regarding this specific operation and list all deviations from this procedure below: